APPENDIX H

TECHNICAL REPORT ON

WETLAND DELINEATION REPORT

BP CHERRY POINT COGENERATION PROJECT

Prepared for:

BP West Coast Products, LLC

Submitted by:

Golder Associates Inc.

Schott and Associates
Portland, Oregon

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EXECUTIVE SUMMARY

Golder Associates performed wetland delineations for the BP Cherry Point Cogeneration Project in Whatcom County, Washington on May 3 and 4, June 11, and August 6, 2001. Additional delineations were performed on January 22 and 23, 2002 to revisit construction staging areas. The results of the field investigations indicate that there are extensive wetlands associated with the low-rolling glacial ground-moraine plains that lie within the construction staging areas and a mosaic of wetlands and grassland pasture that lie within the plant site footprint.

The Cogeneration Project is a 720 megawatts (MW) natural gas-fired combined cycle cogeneration facility. It will provide 85 MW of electrical power and steam to the BP Cherry Point Refinery (Refinery). The remaining electric power generated by the facility will be made available to northwest customers. Because the Cogeneration Project will be an integral part of the Refinery, it must be located in close proximity to the refinery facilities. The project will impact approximately 69 acres, 33.17 acres of which are wetlands, including construction access routes, a natural gas compression station and laydown areas. Approximately 50.89 acres of wetland were delineated and approximately 200 additional acres were subject to reconnaissance level surveys.

The potential project site lies within BP property south of Grandview Road, north of Brown Road, and east of Blaine Road.

Prior to conducting the wetland delineation, the following information was reviewed.

- Previous wetland delineations for the area (1991);
- Whatcom County Soil Survey;
- National Wetland Inventory Maps; and
- Whatcom County Critical Areas Ordinance.

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LIST OF ACRONYMS AND ABBREVATIONS

Ecology	Washington State Department of Ecology
Golder	Golder Associates Inc.
HRSG	Heat recovery steam generator
NHP	National Heritage Program
PEM	Palustrine emergent
PEMA	Palustrine emergent temporarily flooded
PEMC	Palustrine emergent seasonally flooded
PFOA	Palustrine forested temporarily flooded
$PFOH_x$	Palustrine forested permanently flooded excavated
POWH	Palustrine open water permanently flooded
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
USCOE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
WDFW	Washington Department of Fish and Wildlife

1. INTRODUCTION

This report details the findings of wetland delineations performed by Golder Associates (Golder) and Schott and Associates. The wetland delineations were performed in May, June, and August 2001 and January 2002 for the BP Cherry Point Cogeneration Project. This report presents the detailed findings of wetland delineations within the Cherry Point Refinery (construction staging areas) and a parcel located east of the Refinery (proposed plant site). The purpose of these delineations was to determine the impact of a proposed energy-generating facility on wetlands in Whatcom County. The project proponent, BP West Coast Products, LLC, proposes to construct a 720-MW natural gas-fired combined-cycle combustion turbine cogeneration facility within a 33.17-acre parcel of land adjacent to the refinery. Approximately 36 acres of land located within the Refinery fenceline would be used for construction staging and assembly. The plant would be configured with three combustion turbines, each driving an electric generator. Each of the gas turbine trains would be equipped with a heat recovery steam generator (HSRG) with duct firing capability to augment steam production. Steam would be produced at high pressure in the heat recovery steam generator and sent to one steam turbine-driven electric generator, with extraction and condensing capability. The refinery would also serve as a "steam host" for a portion of the steam produced by the combustion turbines.

The proposed project is located in Whatcom County, Washington, approximately two miles east of Cherry Point within the Strait of Georgia (T39N, R1E, S8). A vicinity map is provided in Figure 1. A study site map is provided in Figure 2.

Whatcom County is bordered by Puget Sound and the Georgia Strait on the west and by Canada on the north. The eastern two-thirds of the county lie within the Mount Baker National Forest; however, neither the plant site nor construction staging areas are within this forest. The western portion of the county lies primarily within the Puget Sound Basin and most of the lands within the basin are agricultural. The basin consists of alluvial flats and low, smooth glacial and post-glacial fluvial terraces, low rolling glacial plains, and occasional frontal recessional moraines of more pronounced relief.

2. SITE DESCRIPTION

The proposed project is located east of the BP Cherry Point Refinery within BP property boundaries. The BP Refinery and land is mainly zoned Heavy Impact Industrial and Light Industrial and is entirely contained within the Cherry Point Major Industrial Urban Growth Area / Port Industrial as defined in the *Whatcom County Comprehensive Land Use Plan* (Whatcom County, 1997).

The Cogeneration Project is designed to be an integral part of the refinery by providing the entire refinery electrical requirements (85 MW) and a portion of the refinery steam requirements. The proposed project site is in close proximity to the refinery, in the area south of Grandview Road, north of Brown Road, and east of Blaine Road. The proposed 33.17-acre parcel for the Cogeneration Project and the 36 acres to be used for construction staging are located entirely on BP property.

Currently, the site is undeveloped abandoned grassland pasture and was most likely historically used for agricultural purposes. There are several man-made drainage ditches that traverse the property. These ditches were most likely used during farming to remove excess water from the soils in winter and spring by increasing runoff rates from adjacent wetlands. These ditches are not functioning as originally intended because they have not been maintained and are partially vegetated. This vegetation may inhibit surface water flow and decrease the removal of water from wetlands. Emergent herbaceous wetlands occupy a large portion of the site, with the exception of a forested portion in the east and a hybrid poplar (*Populus trichocarpa*) crop planted by BP in the east and north.

3. METHODOLOGY

3.1 Study Objectives

This wetland delineation report was prepared for the Cogeneration Project in accordance with Whatcom County's critical areas ordinance (Whatcom County, 2001) and the U.S. Army Corps of Engineers (USCOE) requirements for wetland delineation and reporting (Environmental Laboratory, 1987). Specific objectives of the study were to:

- Conduct a wetland delineation within the proposed project area using the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987) (Corps manual) as required by the USCOE, the Washington Department of Ecology's *Washington State Wetlands Identification and Delineation Manual* (Ecology manual), and Whatcom County's critical areas ordinance guidelines for wetlands (Whatcom County, 2001).
- Categorize the wetlands by the U.S. Fish and Wildlife Service (USFWS) classification system (Cowardin et al., 1979) and rate wetlands using Ecology's wetlands rating system (Ecology, 1993).
- Assess wetlands using the *Methods for Assessing Wetland Functions. Vol. 1: Riverine and Depressional Wetlands in the Lowlands of Western Washington* (Ecology, 1999).

3.2 Review of Existing Information

Before undertaking onsite observations, a literature review was performed to identify records of wetlands within the project area. The following information was collected and examined:

- U.S. Geological Survey (USGS) topographic map of Blaine quadrangle (USGS, 1972)
- National Wetlands Inventory map of project area (USFWS, 1987)
- *Soil Survey of Whatcom County* (USDA, 1953 and 1992)
- Whatcom County Municipal Code Title 16, Critical Areas Ordinance
- *Washington State Wetlands Identification and Delineation Manual* (Ecology, 1997)
- *Hydric Soils of the United States* (NRCS, 1987)
- *Whatcom County Critical Inventory* (Whatcom County, 2000)

3.3 Wetland Delineation

A wetland delineation of the project area was performed in accordance with *the Corps Manual* and the Ecology Manual . According to both manuals, an area must exhibit indicators of hydrophytic vegetation, hydric soils, and wetland hydrology to be considered a wetland. These criteria are mandatory and must all be met for an area to

be identified as wetland, except under circumstances when a wetland is considered a disturbed area or problem wetland. These criteria are discussed below.

Field conditions were evaluated by walking through the entire project area to identify wetland characteristics. Delineation of the southern portion of the plant site was performed on two dates (May 3-4, 2001). Delineation of the northern portion of the plant site was performed on June 11, 2001. Delineation of potential construction staging and assembly (laydown) areas was performed on August 6, 2001. The construction laydown areas were redelineated in January 2002. In each area having wetland characteristics, data were recorded on wetland data forms to indicate dominant plant species, soil conditions in test pits, and evidence of hydrologic conditions. Upland areas adjacent to each potential wetland area were also surveyed. Based on the field data, a wetland / nonwetland determination was made for each area examined. Color photographs were taken of representative areas of the site (Appendix A). Observations of all wildlife species were also noted during each site visit.

Potential wetland areas within the project area were identified as distinct vegetation units, to which the three parameters listed above were applied. A vegetation unit is an area having similar physical features or plant characteristics. Features such as species uniformity, dominance, distinct topographic breaks, and obvious similarities in soils of hydrologic indicators are factors that define a vegetation unit. Following the confirmation of all three wetland parameters, wetland boundaries were marked by placing fluorescent flagging along the perimeter. The boundaries were subsequently surveyed by Larry Steel and Associates.

3.3.1 Vegetation

Plant species are divided into three strata: trees, shrubs, and herbaceous species. Stratum dominance was calculated for each vegetation unit. Dominant species are those plants in each stratum that when ranked in decreasing order of abundance and cumulatively totaled, immediately exceed 50 percent of the total dominance measure for the stratum, plus any additional plant species comprising 20 percent or more of the total dominance for the stratum (Environmental Laboratory, 1987).

Hydrophytic vegetation is defined as macrophytic plant life growing in water, soil, or substrate that is periodically deficient in oxygen. For each plot, the percent areal coverage was estimated for each plant species present, and dominant species were determined. Plants were identified using *Flora of the Pacific Northwest* (Hitchcock and Cronquist, 1973). Species were assigned a Wetland Indicator Status (Reed, 1988 and 1993), which is based on the estimated probability of each plant species' occurrence in wetlands or nonwetland (see Table 1).

The indicator status of the dominant species within each vegetative unit (tree, shrub, herb) is used to determine if the plant community of an area is characterized as hydrophytic. If greater than 50 percent of the dominant plants in a unit have an indicator status of OBL, FACW, or FAC, the vegetation is considered to be hydrophytic in both manuals.

3.3.2 Soils

The hydric soils list (Natural Resources Conservation Service [NRCS], 1995) was consulted for the presence of mapped hydric soils within the project area. Soils were assessed in the field using a soil auger to examine soil for hydric indicators to a minimum depth of 18 inches with a soil auger. Soil characteristics examined include hue, value, and chroma, as identified on a Munsell Soil Color Chart (Munsell Color, 2000). Hydric soil indicators include mottles, low soil chroma, gleying, and high organic content. Mottles are spots or blotches of contrasting color occurring within the soil matrix. Gleyed soils are predominantly neutral gray in color.

3.3.3 Hydrology

Wetland hydrology is defined as permanent or periodic inundation or soil saturation, to within 12 inches of the soil surface, for a significant period (usually a week or more) during the growing season (Environmental Laboratory, 1987). Where positive indicators of wetland hydrology are observed, it is assumed that wetland hydrology occurs for a significant period of the growing season. Direct indicators of wetland hydrology include areas of ponding or soil saturation. Indirect indicators include dry algae on bare soil, water marks on soil or leaves, drift lines, oxidized root channels associated with living roots and rhizomes, sediment deposits, and drainage patterns.

Duration of inundation and / or soil saturation for the Ecology Manual is based on 5 percent of the growing season, which is based on the number of days the soil temperature is at least 5 degrees Centigrade. The growing season in the project area is approximately 225 days from April through September (USDA, 1953). Within the project area, direct and indirect indicators of wetland hydrology were recorded and described on data sheets.

3.4 Wetland Classification and Rating

Cowardin et al. (1979) devised a classification system based on physical wetland attributes (i.e., vegetation, soils, and water regime) that has been adopted by the USFWS. This Cowardin classification system was used to identify wetland types in the project area.

The Department of Ecology's rating system was used to rate wetlands in the project area. Ecology has developed a four-tiered wetland rating system based on wetland vegetation types, wetland acreage, and number of wetland classes (Ecology, 1993). The four categories of wetlands identified by Ecology are hierarchical: category I wetlands exhibit more valuable wetland features, and category IV wetlands exhibit less valuable attributes. Table 2 depicts Ecology's wetland rating system for Western Washington. Whatcom County has not established a wetland classification or rating system. Wetland rating data sheets can be found in Appendix B.

3.5 Wetland Functional Assessment

Methods to complete a functional assessment of wetlands typically involve the identification and evaluation of physical attributes that provide predictive rather than direct measurement of specific ecological functions of concern. Whatcom County has not established a wetland functional assessment, but Whatcom County Code (Whatcom County, 2001) states the following:

> The county shall utilize the best-suited and most scientifically valid functional rating system for purposes of determining applicable wetland, stream, or river buffer adjustments or mitigation requirements. Any functional assessment utilized by the county shall address the following functional attributes:
>
> - Erosion control and shoreline stabilization;
> - Fish habitat;
> - Ground water recharge and base flow maintenance;
> - Storm water attenuation;
> - Water quality improvement; and
> - Wildlife habitat.

The functional assessment was performed by Golder (Golder, September 2001) using Ecology's *Methods for Assessing Wetland Function Volume 1 – Riverine and Depressional Wetlands in the Lowlands of Western Washington* (Ecology, 1999). Typical functions assessed included: natural biology (wildlife), hydrology, erosion control, nutrient and sediment removal, flood storage, groundwater recharge, water quality, native plant richness, and potential for primary production.

4. AFFECTED ENVIRONMENT

The following section presents the results of the wetland delineation for the Cogeneration Project, including a description of existing information that was reviewed and an analysis of wetland conditions observed within the project area vicinity.

4.1 Analysis of Existing Information

Information gathered from published sources, maps, and agency correspondence was reviewed to assess the historical and current presence of wetlands within the project area. Significant findings are summarized below.

4.1.1 Water Resources

The project site is located in an area of continental glacial scouring where a cemented layer of soil is within 12 inches of the surface. Precipitation moves slowly through the soils and accumulates in areas where the hardpan is nearer the surface. Annual rainfall within the area is 40.7 inches (Goldin, 1992). There are several east-west and north-south drainage ditches that are located within the plant site footprint. The main east-west running ditch is approximately five to six feet wide and collects water moving in a northwesterly direction. Because the site is relatively flat, there is minimal drainage within the ditches in the drier months. There is more water flow within the plant site and construction laydown areas during the fall and winter. Water was observed flowing from the sites through the ditches, moving first westerly to the Grandview Road fenceline, and then northerly.

The National Wetlands Inventory (NWI) map indicates that the area contains a mosaic of wetland types that encompass the entire site with the exception of an area in the middle northern portion of the site near Grandview Road (see Figure 3). The wetland types listed within the area are palustrine emergent temporarily flooded (PEMA), palustrine emergent seasonally flooded (PEMC), and palustrine open water permanently flooded excavated ($POWH_x$).

Whatcom County includes wetlands as critical areas, and the functions of wetlands are protected under Title 16 of the Whatcom County Municipal Code (January, 2001).

4.1.2 Soils

The Whatcom County Soil Survey (Goldin, 1992) indicates that western Whatcom County has scoured glacial areas with exposed sedimentary rocks underlain by clay till (USDA, 1953). Soils are within several soil series including Birch Bay, Kickerville, Labounty, Tromp, and Whitehorn (Figure 4). A detailed description of each soil series within the project area follows.

Soils within the Birch Bay Series are located within the plant site footprint and the construction laydown areas. These soils are on wave-reworked glaciomarine drift plains and consist of very deep, moderately drained soils formed in an admixture of loess and

volcanic ash over glaciofluvial deposits and glaciomarine drift. Soils in the upper layers are dark brown (10YR 3/3) silt loams to dark yellowish brown (10YR 4/4) silt loams. Slopes are 0 to 3 percent and annual precipitation within areas containing these soils is 30 to 40 inches. These soils are within hydrologic group C.

Soils within the Kickerville Series are located in the northern portion of the plant site (Figure 4). Soils within the Kickerville silt loam complex are on outwash terraces and composed of loess and volcanic ash over glacial outwash. These soils occur within areas that have 0 to 15 percent slopes and 35 to 55 inches of annual precipitation. Soils are dark brown (10YR 3/3) to yellowish-brown in color (10YR 5/4). Kickerville silt loams have rapid drainage and moderate moisture-holding capacity. These soils are located just north of the proposed plant site footprint. Soils within this series are within hydrologic group B.

Soils within the Labounty Series are identified in close proximity to the plant site. These soils are on wave-reworked glaciomarine drift plains and consist of poorly drained soils formed in loess and glaciomarine drift. Slopes are 0 to 3 percent and annual precipitation for areas containing this soil type is 35 to 55 inches. Soils are dark brown (10YR 3/2) silt loams in the upper horizon. Soils within this series are listed on the National Hydric Soils List (NRCS, 1987) and the Washington State Hydric Soils List (NRCS, 1995), although they are not listed as hydric in the Whatcom County Hydric Soils List (NRCS, 2000).

Soils within the Whitehorn Series are identified within the project area in the plant site footprint and construction laydown areas. These soils are on wave-reworked glaciomarine drift plains and consist of very deep, poorly drained soils formed in volcanic ash, loess, glaciofluvial deposits, and glaciomarine drift. Slopes are 0 to 2 percent and annual precipitation for areas containing this soil type is 30 to 40 inches. Soils are very dark brown (10YR 2/2) silt loams or dark grayish brown (10YR 4/2) with fine granular structure. Canopy vegetation within this series includes Douglas-fir, white fir, spruce, and cedar. Other vegetation within this soil series includes alder, bigleaf maple, willow, birch, hybrid poplar, bracken, blackberry, salmonberry, thimbleberry, and red huckleberry. Soils of the series have been used for crops and agriculture.

Soils within the Whitehorn series are listed on the National Hydric Soils List (NRCS, 1987) and the Washington State Hydric Soils List (NRCS, 1995), although they are not listed as hydric in the Whatcom County Hydric Soils List (NRCS, 2000). The hydrologic group for these soils is D. Table 3 shows soils groups and corresponding infiltration rates.

Soils within the Tromp Series are identified in close proximity to the plant site. Soils of the Tromp series occur primarily on outwash terraces and consist of very deep, moderately well drained soils that formed in a mixture of volcanic ash and loess over glacial outwash. Slopes are 0 to 2 percent and precipitation within these areas is 40 to 55 inches per year. Soils of this series have a dark-brown (10YR3/3) to light yellowish brown (10YR6/4) surface soil and are relatively dry. The hydrologic soils group for the Tromp Series is C.

4.2 Analysis of Site Conditions

The plant site footprint and construction laydown areas were examined for plant communities that are indicative of wetlands (see Figures 5 and 6). An herbaceous wetland complex extends and fragments into a forested area southeast of the plant site. The site has relatively little relief but undulates smoothly. Several artificial drainages traverse the site. These drainages are in an east-west orientation and serve to drain the site in a northwesterly direction. The construction laydown areas consist mostly of palustrine emergent wetlands with facultative grasses dominating the vegetation.

Table 4 lists the plant species observed in both upland and wetland plant communities within the project area, identified according to stratum and listed by common and scientific names along with wetland indicator status. Representative photographs of both upland and wetland plant communities within the project area are presented in Appendix A.

4.3 Southern Half of the Cogeneration Plant Site – May 3rd and 4th Delineation

4.3.1 Upland Plant Communities

The upland portion of the southern half of the plant site occurs mainly in perimeter areas containing blackberry thickets along the southern and southwestern border of the parcel (see Figures 5 and 6). These areas are higher in elevation than the rest of the site, which is composed almost entirely of palustrine emergent wetlands. There is an old overgrown road that diverts north from Brown Road directly adjacent to the Cherry Point Refinery. It appears that an orchard may have existed on the upland corner of the site. There are several pear and walnut trees surrounded by Himalayan blackberry thickets just west of the abandoned road. The broader, flatter areas appear to have been under cultivation historically.

The vegetation within the blackberry-dominated upland sites includes Himalayan blackberry, walnut, pear, stinging nettle, Canada thistle, colonial bentgrass, reed canary grass, vetch, rye grass, birds-foot trefoil, bull thistle, evergreen blackberry, alder, and horsetail. The soils range from loams to silty clay loams (7.5 YR 3/3 and 7.5 YR 3/4). These soils are deeper above the cemented hardpan and are better drained than the adjacent wetlands. These areas had no indicators of wetland hydrology.

In addition to the uplands along the southern and southwestern perimeters of the project area, mosaic uplands occur within the forested portion of the site, which is outside of the plant footprint (Figures 5 and 6). These areas are dominated by cedar, Douglas-fir, Himalayan blackberry, twinberry, salmonberry, oceanspray, Indian plum, stinging nettle, bleeding heart, sword fern, and piggy-back plant.

4.3.2 Wetland Plant Communities

The wetlands observed during the survey of the plant site and construction laydown areas are dominated by herbaceous grasses including red top, velvetgrass, colonial bentgrass, and meadow foxtail. There is little difference in plant communities of wetlands and adjacent uplands with the exception of invading facultative upland and upland species including vetch, plantain, and thistle.

Based on the extent of the wetlands, upland areas were delineated within the extensive wetland system. The vegetation, soils, hydrology, functions, and classification of the areas are described below. The completed wetland determination data forms are provided in Appendix C. Corresponding soil plot data locations are shown with wetlands in Figure 7.

4.4 Northern Half of the Site – June 11th Delineation

4.4.1 Upland Plant Communities

The upland portion of the northern half of the plant site is interlaced with palustrine emergent wetland areas. The upland areas are dominated by blackberry thickets that occur in areas that are slightly raised in elevation relative to adjacent wetland areas. Some Douglas fir saplings have been planted by BP in these areas as well. Upland vegetation within the northern portion of the site is similar to that of the southern half of the site.

4.4.2 Wetland Plant Communities

Wetlands within the northern portion of the site are primarily palustrine emergent systems that are dominated by clumps of soft rush and creeping buttercup. Creeping buttercup communities do not exist on the southern portion of the property. Data sheets for the northern wetland and upland communities are presented in Appendix C.

4.5 Potential Construction Laydown Areas – August 6 Delineation, January 22 and 23 Redelineation

4.5.1 Upland Plant Communities

The upland areas within the construction laydown sites occur primarily along the northern perimeter of the site (Figures 5 and 6). Some Douglas-fir communities exist the upland areas with an understory of facultative grasses that appear frequently in wetland areas. These areas are slightly raised in elevation and appear to have been significantly disturbed due to the presence of sandy soils and gravel that are not reflective of native conditions. In addition, Himalayan blackberry is beginning to invade the upland areas along the fringes.

4.5.2 Wetland Plant Communities

Wetlands within the proposed construction laydown areas are primarily palustrine emergent systems that are dominated by clumps of soft rush, reed canary grass, colonial bentgrass, and meadow foxtail. Several small patches of willow, consisting of approximately three or four shrubs each, occur in the northern portion of the proposed laydown areas. Relatively unhealthy Douglas fir trees occur within the wetland / upland transition zone and approximately 15 uprooted, wind-thrown trees were observed on the site. These trees had very shallow root systems and appeared to have been stunted in their growth. Planting plans indicate the trees were planted in 1989-1991 and they are smaller than they should be at this time (see Figure 8). Approximately nine mature hybrid poplars occur north of Wetland I, which is a ditch that will not be used for laydown (not impacted). The understory within the hybrid poplar area is dominated by reed canary grass. Data sheets for the proposed construction laydown areas are in Appendix C.

4.6 Wildlife within the Wetland Components

The emergent wetland component serves as habitat for field mice, voles, and various small rodents. Several mice were observed within the emergent complex on field visits. The hybrid poplar planting areas serve as higher quality habitat relative to the emergent complex. The emergent complex area was most likely agricultural habitat based on former land uses. No reptiles or amphibians were observed within this habitat. Animals observed or that may potentially occur within the agricultural area include coyote, American robin, song sparrow, Canada geese, red-tailed hawk, quail, black-tailed deer, rabbit, and rodent and insectivore species.

The forested wetland / upland mosaic area is classified within the Fraser Lowland Ecological Zone (Johnson and O'Neil, 2001). Although the forested area is relatively small in size (approximately 15 acres) and will not be impacted by the proposed Cogeneration Project, wildlife most likely use the emergent wetlands within the proposed plant site to move in and out of the forested areas. One black-tailed deer was observed crossing Brown Road (south of the proposed plant) during a spring field visit. Animals observed or that may potentially occur within the forested component include woodpeckers, red-tailed hawks, small mammals including rodents, insectivores, squirrels, chipmunks, and possibly bats within downed logs and trees.

5. DELINEATIONS

The Cogeneration Project will impact a total of approximately 33.15 acres of low value wetlands, as indicated in Table 5, and described in greater detail below.

5.1 Palustrine Emergent Wetlands

The herbaceous wetland systems encompass a large portion of the both the plant site and construction laydown areas. Figure 7 shows the wetlands that were surveyed, including the proposed plant site footprint and construction laydown areas 1-4, with impacted wetland areas shaded.

5.1.1 Wetland B

Wetland B consists of four wetlands (B1-B4) north of the main east-west drainage ditch within the plant site footprint and total approximately 2.99 acres in size. These wetlands were grouped together based on their close proximity, relatively small sizes, similar vegetation, similar topography, and similar hydrology in the form of high seasonal groundwater.

5.1.1.1 Wetland Vegetation

The vegetation species reported within these herbaceous wetlands include, but are not limited to, rough bluegrass, velvetgrass, bull thistle, tall fescue, Baltic rush, spikerush, and meadow foxtail. The buffers to wetlands B1-B4 consist primarily of herbaceous grasses of an abandoned grassland pasture and Douglas-fir / blackberry thicket areas.

Based on a dominance of species rated facultative or wetter, vegetation in the systems is considered hydrophytic.

5.1.1.2 Soils

The soils mapped for this site include soils within the Birch Bay and Whitehorn Soil Series in the upper 16 inches (Goldin, 1992).

The soils sampled in the wetland data plots were reported as very dark grayish brown / black (10YR 3 / 2; 10 YR 4 / 1) silty clays with dark yellowish brown (10 YR 3 / 4) few, fine and both faint and distinct mottles from the surface to a depth of 12 inches. These soils were considered hydric due to a low chroma and the presence of mottles. The structure in the top 8 inches was granular and most often subangular and blocky below that depth. Wetlands within the B complex were delineated in June and soil saturation, although occurring in the upper 12 inches, was significantly less than that of Wetland D, located south of Wetlands B1-B4, which was delineated in early May.

Soil pit locations are shown on Figure 7. Numbers shown on data sheets (Appendix C) correspond to pit locations.

5.1.1.3 Hydrology

Wetland hydrology within the wetlands composing Wetland B results from high seasonal groundwater due to precipitation and the impermeable nature of the soils within the area. During winter months, there is lateral flow from adjacent areas contributing to the hydrology of the wetland, but this is seasonal and does not occur regularly in the spring and summer. Precipitation contributes greatly to the hydrology, as the soils were significantly wetter in the late spring than in early to mid summer. These wetlands are slightly depressed topographically and nearby ditches contribute to inflow and outflow in the wetlands.

5.1.1.4 Classification and Rating

According to the wetland classification system established by the USFWS (Cowardin et al., 1979), Wetland B, including B1-B4, would be classified as a palustrine emergent (PEM) wetland. Ecology would most likely rate these wetlands as Category III wetlands based on the results of the wetland rating field form (Appendix B). The wetlands within the B complex are not rare or unique and do not contain irreplaceable or rare wetland types.

5.1.2 Wetland C

5.1.2.1 Wetland Vegetation

Wetland C is located within the eastern portion of the plant site footprint and is approximately 4.38 acres in size. Hybrid poplar farming areas are located directly east of the wetland. The vegetation species reported within this herbaceous wetland include, but are not limited to, creeping buttercup, velvetgrass, rough bluegrass, Baltic rush, and meadow foxtail. Adjacent buffer vegetation is dominated primarily by invasive species including Himalayan blackberry and bull thistle. Planted Douglas-fir upland knolls also occur in the vicinity of Wetland C. Based on a dominance of species rated facultative or wetter within Wetland C, vegetation in this system is considered hydrophytic.

5.1.2.2 Soils

The soils mapped for this site include soils within the Birch Bay and Whitehorn Soil Series in the upper 16 inches (Goldin, 1992).

The soils sampled in the wetland data plots were reported as dark gray and very dark gray (10YR 3/1; 10 YR 4/1) sandy clay and silty clay loams with dark yellowish brown (10 YR 3/4) many, common, distinct mottles from the surface to a depth of 12 inches. In addition, gleying occurs at approximately 9 inches (5GY 5/1). These soils were considered hydric due to a low chroma and the presence of mottles. The structure in the top 8 inches was granular and most often subangular and blocky below that depth. Wetland C was delineated in June and soil saturation, although occurring in the upper 12 inches, was significantly less than that of Wetland D, located south of Wetland C, which was delineated in early May.

5.1.2.3 Hydrology

Wetland hydrology within Wetland C is due to precipitation and the perched condition of the groundwater table in addition to topographic depression and impermeable soils. Precipitation contributes most greatly to the hydrology, as the soils were significantly wetter in the late spring than in early to mid summer.

5.1.2.4 Classification and Rating

According to the wetland classification system established by the USFWS (Cowardin et al., 1979), Wetland C would be classified as a palustrine emergent (PEM) wetland. Ecology would most likely rate these wetlands as Category III wetlands based on the results of the wetland rating field form (Appendix B). The wetland is not rare or unique and does not contain irreplaceable or rare wetland types.

5.1.3 Wetland D

Wetland D includes the large wetland complex south of the main east-west ditch that runs through the proposed plant footprint (Figure 7).

5.1.3.1 Wetland Vegetation

Wetland D is located within the southern portion of the plant site footprint. The surveyed portion of Wetland D is approximately 40.21 acres, although the wetland extends to the east and was not completely delineated. The wetland extends into the hybrid poplar planting area to the east and then breaks up into mosaic wetland/upland areas. Ecology's wetland rating forms (Appendix B) score wetlands for several components, one of which is size. Size categories are as follows: <0.10, 0.10-1, 1-5, 5-10, 10-40, 40-200 and >200 acres. Wetland D falls under the 40-200 acre category. Since Wetland D is not likely larger than 200 acres, the incomplete survey would not affect the score for this component and, therefore, would likely not affect the wetland rating. The vegetation species observed within this herbaceous wetland include, but are not limited to, vernal sweetgrass, velvetgrass, soft rush, slough sedge, colonial bentgrass, reed canary grass, Kentucky bluegrass, birds-foot trefoil, giant horsetail, Canada thistle and Himalayan blackberry along the upland/wetland transition zone. Adjacent upland vegetation is dominated primarily by Himalayan blackberry. Based on a dominance of species rated facultative or wetter within Wetland D, vegetation in the systems is considered hydrophytic.

5.1.3.2 Soils

The soils mapped for this site include soils within the Birch Bay and Whitehorn Soil Series in the upper 16 inches (Goldin, 1992).

The soils sampled in the wetland data plots varied slightly but were generally reported as dark gray and very dark grayish brown (10YR 3/1; 10 YR 2/2) silty loams and silty clay loams with grayish brown, brown, and dark reddish brown (2.5Y 5/2, 10 YR 5/2, 7.5 YR 2.5/2) common, distinct mottles from the surface to a depth of 12 inches. These

soils were considered hydric due to a low chroma and the presence of mottles. The structure throughout the soils was generally granular.

Many of the sample plots occurred in areas with a restrictive hardpan of cemented soil occurring between 6 and 16 inches. Some areas contained mixed soils with decomposing gravel and a few rhizospheres. Charcoal pieces were observed in several of the soil samples and gleying of some soils occurred at approximately 12 inches. Most soil pits within Wetland D filled with water within 3 inches of the soil surface and all pits contained saturated soil at the surface.

Wetland D was delineated in early May and soil saturation and surface inundation was evident in most areas within the large complex. Less surface inundation occurred in areas adjacent to the ditches.

5.1.3.3 Hydrology

Wetland hydrology within Wetland D is due to precipitation, lateral flow in the winter months and the restrictive nature of the soils within the area. Precipitation contributes most greatly to the hydrology, as the soils were much wetter in the late spring than in early to mid summer. Water moves laterally toward the main east-west ditch and is then carried via the main north-south ditch toward Grandview Road. The soils prevent rapid movement of water through a cemented hardpan layer of compressed clay. Therefore, percolation is extremely slow. This regime is typical of areas that have been formed by glacial movement. Wetland D was delineated in early May and areas of shallow inundation were observed.

5.1.3.4 Classification and Rating

According to the wetland classification system established by the USFWS (Cowardin et al., 1979), Wetland D would be classified as a palustrine emergent (PEM) wetland. Ecology would most likely rate this wetland at the high end of a Category III wetland based on the results of the wetland rating field form (Appendix B). The wetland is not rare or unique, although it is of significant size, and does not contain irreplaceable or rare wetland types.

5.1.4 Wetland F

Wetland F is approximately 13.71 acres is size and is located within construction laydown area 2 (Figure 7). These wetlands were delineated in January 2002.

5.1.4.1 Wetland Vegetation

The dominant vegetation species within Wetland F are herbaceous grasses including colonial bentgrass, meadow foxtail, and velvetgrass. Soft rush occurs in the most saturated areas of the wetland. Five small patches of willow, consisting of Pacific willow and scouler's willow, occur within the northwestern portion of the property. These patches contain approximately three to five shrubs, each with an understory of soft rush. A small area (approximately 0.6 acres) of young, immature hybrid poplar

trees with average dbhs of approximately 2-3 inches, occurs within a portion of Wetland F near the northwest corner of the existing contractor's parking lot (Figure 7). Adjacent upland vegetation features patches of Douglas-fir that occur on slightly raised knolls throughout the property. These firs were planted in 1989 –1991, and have had little success in the area due to the wetland hydrologic regime that dominates the area. Based on a dominance of species rated facultative or wetter in Wetland F, vegetation in the wetland is considered hydrophytic.

5.1.4.2 Soils

The soils mapped for this site include soils within the Birch Bay and Whitehorn Soil Series in the upper 16 inches (Goldin, 1992).

The soils sampled in the wetland data plots were generally very dark brown (10 YR 2/2) to dark brown (10YR 3/1) with common mottles varying from reddish yellow (7.5 YR 6/6) to yellowish brown (10YR 5/4). Grayish green gleying also occurred in some areas (5GY 5/2). The soils were primarily silty clay loams and were saturated in most pits. Structurally, the soils were generally granular throughout or granular to 8 inches and subangular blocky at depths beyond 8 inches. Surface inundation was common throughout the wetland system.

5.1.4.3 Hydrology

Wetland hydrology within Wetland F is attributed to the relatively impermeable nature of the soils within the area and the topographically depressed nature of the site. Lateral flow is not as evident in these areas because there are less pronounced east-west ditches within the Refinery boundaries and more land disturbance due to roads and paved areas.

5.1.4.4 Classification and Rating

According to the wetland classification system established by the USFWS (Cowardin et al., 1979) and the NWI mapping, Wetland F would be classified as a palustrine emergent wetland (PEM) with a small shrub-scrub (SS) component in the form of the immature stand of hybrid poplars. Ecology would most likely rate this wetland component at the high end of a Category III wetland based on the results of the wetland rating field forms (Appendix B). The wetlands are not rare or unique and do not contain irreplaceable or rare wetland types.

5.1.5 Wetland G

Wetlands G is located within construction laydown Area 3 and is bordered to the east and west by roads and to the north and south by gravel parking lots. The entire isolated patch of vegetation is wetland and is approximately 5.46 acres in size.

5.1.5.1 Wetland Vegetation

The dominant vegetation species reported within Wetland G are herbaceous grasses including reed canary grass, meadow foxtail, velvetgrass, and colonial bentgrass. English plantain and thistle species including bull and Canada were observed and comprised a low percentage of the total plant species. Based on a dominance of species rated facultative or wetter, vegetation in the wetland is considered hydrophytic.

5.1.5.2 Soils

The soils mapped for this site include soils within the Whitehorn Soil Series in the upper 16 inches (Goldin, 1992).

The soils sampled in the wetland data plots were very dark grayish brown (10 YR 3/2) with few, if any, mottles in the upper 6 inches. Below 6 inches, soils generally changed to dark grayish brown (2.5 Y 4/2) and grayish brown (2.5 Y 5/2) with many different colors of mottles including, but not limited to, olive brown (2.5Y 4/4), grayish brown (2.5YR 5/2) and dark yellowish brown (10YR 3/4). Mottles were most often common and distinct. Gleying (10Y 5/1) occurred in some soil plots below 12 inches. Soils were saturated at the time of the site visit and inundation occurred over approximately 40 percent of the property. Soils contained rhizospheres and were silt loams with granular structure to 6 inches and subangular blocky structure below 6 inches.

5.1.5.3 Hydrology

Wetland hydrology within Wetland G is due to precipitation that is perched at approximately 10 inches. This perching is due to the relatively impermeable nature of the soils within the area.

5.1.5.4 Classification and Rating

According to the wetland classification system established by the USFWS (Cowardin et al., 1979) and the NWI mapping, Wetland G would be classified as a palustrine emergent (PEM) wetland. Ecology would most likely rate this wetland component as a Category III wetland based on results of the wetland rating field forms (Appendix B). The wetland is not rare or unique and does not contain irreplaceable or rare wetland types.

5.1.6 Wetland H

Wetland H is separated from Wetland G by a road and is located in the proposed access road corridor from the Refinery to the proposed plant site (see Figure 7). The wetland was visited on January 30, 2002 when approximately 10 inches of snow covered the ground. A complete delineation of the entire wetland was not performed because of these conditions. Soils were sampled within the proposed access road corridor and were found to be black (7.5YR 2.5/1) and very dark brown (10YR 2/2) silt loams with grayish brown (2.5Y 5/2) few, medium, distinct mottles. These soils exhibited hydric characteristics and therefore the entire corridor was assumed to have wetland

characteristics. The surveyed area of this portion of Wetland H is approximately 0.22 acres. The total area of Wetland H is estimated to be approximately 8 acres.

5.1.7 Wetland J

Wetland J is located in construction laydown area 1 (see Figure 7) and is approximately 4.39 acres in size. The wetland is bordered on all sides by roads or gravel walkways. Several pipes serve to drain the wetland on its northern boundary. A slight rise in elevation occurs in the southern portion of the parcel. This elevation was likely caused by the placement of fill material. The elevated area provides sufficient drainage and does not exhibit wetland characteristics.

5.1.7.1 Wetland Vegetation

The vegetation species observed within this herbaceous wetland include colonial bentgrass, meadow foxtail, and red top, with some areas that are comprised exclusively of reed canary grass. Vetch and Kentucky bluegrass occur in the upland / wetland transition zone in the southern portion of the site. Based on a dominance of species rated facultative or wetter within Wetland J, vegetation in the system is considered hydrophytic.

5.1.7.2 Soils

The soils mapped for this site include soils within the Whitehorn Soil Series in the upper 16 inches (Goldin, 1992).

The soils sampled in the wetland data plots were very dark grayish brown (10YR 3/2) and brown (10YR 4/3) in the upper 4 inches. Below 4 inches, soils were dark grayish brown (10YR 3/2) and dark gray (2.5Y 4/1) with many, faint, light yellowish brown (10YR 6/4) mottles. A gleyed layer (10Y 5/1) was observed below 8 inches with many, medium, distinct, dark yellowish brown (10YR 4/4) mottles. Generally, soils were granular silty loams in the upper 4 inches and subangular blocky silty clay loams below that depth. Soils were saturated at 3 inches. These soils were considered hydric due to a low chroma, gleying, and the presence of mottles.

5.1.7.3 Hydrology

Wetland hydrology within Wetland J is due to primarily to precipitation and runoff from adjacent walkways and roads. Approximately 65 percent of the wetland was inundated at the time of the field visit (January 2002).

5.1.7.4 Classification and Rating

According to the wetland classification system established by the USFWS (Cowardin et al., 1979), Wetland J would be classified as a palustrine emergent (PEM) wetland. Ecology would most likely rate this wetland as a Category III wetland based on the results of the wetland rating field form (Appendix B). The wetland is not rare or unique, and does not contain irreplaceable or rare wetland types.

5.2 Wetlands Containing Forests or Planted Hybrid Poplars

5.2.1 Wetland A

Wetland A is located immediately south of Grandview Road. The wetland system consists of palustrine emergent wetlands with planted hybrid poplars that will eventually be harvested for pulpwood. It is unlikely that this wetland system would be considered forested because the hybrid poplar trees were planted for harvest.

5.2.1.1 Wetland Vegetation

The system is dominated by hybrid poplars in the canopy and the primary understory is creeping buttercup, bentgrass, and bluegrass species. Based on a dominance of species rated facultative or wetter, vegetation in the wetland is considered hydrophytic.

5.2.1.2 Soils

The soils mapped for this site include soils within the Birch Bay and Whitehorn Series of clay till soils in the upper 16 inches (Goldin, 1992). This wetland was delineated in June, approximately one month after the delineations performed for Wetlands D and E and hydrology reflected the change in season. Soils were considerably less saturated and no freestanding water was evident in the soil pits. Due to the low chroma and mottling that occurs within this area, soils are considered hydric.

5.2.1.3 Hydrology

Wetland hydrology within Wetland A is due to the restrictive nature of the soils within the area in association with the upgradient watershed and precipitation.

5.2.1.4 Classification and Rating

According to the wetland classification system established by the USFWS (Cowardin et al., 1979) and the NWI mapping the planted hybrid poplar portion of the Wetland A would likely be classified as a palustrine emergent (PEM) wetland. Ecology would most likely rate this wetland as a Category III wetland based on the results of the wetland rating field form (Appendix B).

5.2.2 Wetland E

The herbaceous Wetland D extends into a forested area, Wetland E, on the southeast corner of the parcel. This area is approximately 15 acres in size and is a mosaic of uplands and wetlands. The amount of wetland habitat within the area is 1.25 acres (Figure 5). Several large trees have been uprooted by the wet conditions, creating upland habitat where they fell.

5.2.2.1 Wetland Vegetation

The dominant vegetation species reported within the forested wetland include Himalayan blackberry and small patches of birch, cedar, piggy-back plant, spikerush, twinberry, hardhack, oceanspray, hybrid poplar, and slough sedge. Based on a dominance of species rated facultative or wetter, vegetation in the wetland is considered hydrophytic.

5.2.2.2 Soils

The soils mapped for this site include Whitehorn Soils in the upper 16 inches (Goldin, 1992).

The soils sampled in the wetland data plots were similar to those described within the herbaceous wetland component, although there was a higher amount of organic soils from decomposition within the forested habitat. Several soil pits resulted in refusal at approximately 4 inches because of tree and shrub roots. Due to the dense forested environment, several soil plot locations within Wetland E were not located and therefore, not included on the survey map (Figure 7).

5.2.2.3 Hydrology

Wetland hydrology within the wetland portions of the forested area is also due to the impermeable nature of the soils within the area. Additionally, the upland mounds within the forested area contribute to runoff as water moves into the depressions of the wetland system.

5.2.2.4 Classification and Rating

According to the wetland classification system established by the USFWS (Cowardin et al., 1979) and the NWI mapping, the wetlands within the forested portion of the project area would be classified as a forested (F) wetland. Ecology would most likely rate this wetland component as a Category II/III wetland based on results of the wetland rating field forms (Appendix B).

5.2.3 Wetland I

Wetland I is a forested area associated with a ditched channel that bisects the construction laydown areas in an east/west direction and will not be impacted by construction or operation of the proposed Cogeneration Project. This area is different from the other wetland areas in that it is a riverine flow-through wetland, not a depressional outflow wetland. It is associated with a deeper channel that runs north to south and functions at a higher level in regard to amphibian habitat and biomass export. The channel is intermittent and flows during winter and spring and during times of high precipitation. Some areas of the channel are scoured and saturated, while others are completely vegetated with slough sedge. A gravel walking trail runs parallel to the channel and then crosses by means of a bridge. Wetland J is directly south of the channel and drainage pipes divert excess water (moving downgradient in a

northwesterly direction) from the herbaceous area into the channel. Wetland I is approximately 0.15 acre in size (see Figure 7).

5.2.3.1 Wetland Vegetation

The dominant vegetation species reported within the forested/channelized wetland include alder, hybrid poplar, willow, and an herbaceous understory of slough sedge, Baltic rush, and soft rush. Hardhack and evergreen blackberry comprise the shrub layer of the wetland. Based on a dominance of species rated facultative or wetter, vegetation in the wetland is considered hydrophytic.

5.2.3.2 Soils

The soils mapped for this site include soils within the Birch Bay Soil Series in the upper 16 inches (Goldin, 1992).

The soils sampled in the wetland data plots were dark brown (7.5 YR 3/2) with light olive mottles (2.5YR 6/2). Soils were moist on the wetland banks of the channel at the time of the site visit, but not saturated. Soils within the channel were saturated, providing an appropriate moisture regime for the obligate wetland species, slough sedge.

5.2.3.3 Hydrology

Wetland hydrology within the channel banks of the forested area is due to the relatively impermeable nature of the soils within the area. Hydrology within the channel is due to both precipitation and collected runoff from the refinery that is culverted under facility roads.

5.2.3.4 Classification and Rating

According to the wetland classification system established by the USFWS (Cowardin et al., 1979) and the NWI mapping, the wetlands within the ditched area would be classified as a palustrine emergent (PEM)/forested (F) wetland. The forested portion of this small wetland complex contains mature hybrid poplar trees that do not appear to have been planted according to BP's planting plan (Figure 8). Ecology would most likely rate this wetland component as a Category III wetland based on results of the wetland rating field forms (Appendix B).

6. THREATENED, ENDANGERED AND PRIORITY SPECIES INFORMATION

A list of threatened or endangered species of plants and animals and priority habitats and species lists were requested from the USFWS, the Natural Heritage Program (NHP), and the Washington Department of Fish and Wildlife (WDFW).

In a response dated July 2, 2001, the NHP responded that there are no known rare, threatened, or endangered species of plants or high quality ecosystems within the project area. The USFWS responded on June 27, 2001 and in November 2001. The response indicated that several listed wildlife species may occur within the project vicinity. These species include wintering bald eagles (*Haliaeetus leucocephalus*), bull trout (*Salvelinus confluentus*), and foraging marbled murrelets (*Brachyramphus mamoratus*). Although these species may occur near Lake Terrell, approximately 1.5 miles southeast of the project area, it is unlikely that these species utilize the area due to the existing industrial character of adjacent properties. Bull trout do not utilize the area and would not be affected by the project.

The WDFW responded to a request for priority species and priority habitat (June 25, 2001). The WDFW indicates that portions of the area are considered priority habitats because they are "wetlands on the flat coastal area from Cherry Point/Lake Terrell, draining north; this area is 'pocked' with hundreds of wetlands, many too small to record" (WDFW, 2001). Bald eagle breeding locations were identified within two miles of the delineated wetlands. Additionally, Terrell Creek runs north and east of the site and Lake Terrell is located southeast of the project area. The Terrell water systems contain several priority species including winter steelhead and coho salmon, although use is limited.

Although listed species of salmonids do not occur within the project area, potential impacts to fish and wildlife species are addressed in a Biological Evaluation (BE) prepared for the BP Cherry Point Cogeneration Project (Golder, 2002b) and within a wildlife section of the Energy Facility Site Evaluation Council Application for Site Certification (Golder, 2002c). Should threatened or endangered species be found within the area, an addendum to the BE will be made and the proper agencies will be notified.

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TABLES

TABLE 1

Wetland Indicator Status

Wetland Indicator Status	Description	Estimated Probability of Being Found in a Wetland
OBL	Obligate: species that almost always occur in wetlands under natural conditions.	>99%
FACW	Facultative Wet: species that usually occur in wetlands but are occasionally found in nonwetlands.	67% - 99 %
FAC	Facultative: species that are equally likely to occur in wetlands or nonwetlands.	34% - 66%
FACU	Facultative Upland: species that usually occur in nonwetlands but are occasionally found in wetlands.	1% - 33%
UPL	Obligate Upland: species that almost always occur in nonwetlands under normal conditions.	< 1%
NL	Not Listed: species that are not listed and are presumed to be upland species.	
NI	No Indicator Status: species that have not yet been evaluated.	

(Adapted from Reed, 1988.)

TABLE 2

The Department of Ecology's Wetland Rating System for Western Washington

Wetland Category	Criteria for Categorization
Category I	• Wetlands that have documented occurrences of Threatened or Endangered species of plant, wildlife, or, fish species recognized by federal or state agencies. • The wetland is already on record with the Washington Natural Heritage Program as a high quality native wetland. **OR** • There is no significant evidence of human-caused changes to topography or hydrology of the wetland (significant changes include clearing, grading, filling, logging of the wetland or its immediate buffer, or culverts, ditches, dredging, diking, or drainage of the wetland). **AND** • There are no populations of non-native plants that are currently present and appear to be invading. **AND** • There is no significant evidence of human-caused degradation of the water quality of the system. • Wetlands that are documented as regionally significant waterfowl or shorebird concentration areas. • Wetlands with irreplaceable ecological functions (i.e., bogs and fens)
Category II	A wetland is considered Category II if it meets none of the Category I criteria and it meets any one of the following five criteria: • Documented occurrences of sensitive species of plant, animal, or fish recognized by federal or state agencies. • Wetlands with significant functions, which may not be adequately replicated through creation or restoration. • Documented priority habitats and species recognized by state agencies. • Freshwater wetlands with significant habitat value (greater than or equal to 22 points). • Wetlands of Local Significance.
Category III	A wetland is considered Category III if it meets none of the Category I or Category II criteria and meets any one of the following three criteria: • Wetlands in which the habitat score for significant habitat value is less than or equal to 21 points. • Wetlands identified as Category III wetlands of local significance; • Estuarine wetlands less than 1 acre.
Category IV	• Wetlands less than 1 acre and hydrologically isolated and comprised of one vegetated class that is dominant (> 80% areal cover) • Wetlands less than two acres and hydrologically isolated and with one vegetated class > 90% of areal cover. • Wetlands that are ponds smaller than 1 acre and excavated from uplands, without a surface water connection to streams, lakes, rivers, or other wetlands.

TABLE 3

Soils Groups and Corresponding Minimum Infiltration Rates

Group	Minimum Infiltration Rate		Soil Description
	In./hr	mm/hr	
A	0.30-0.45	7.6-11.4	Soils having a high infiltration rate. They are chiefly deep, well-drained sands and gravels or deep loess, or aggregate soils. They have low runoff potential.
B	0.15-0.30	3.8-7.6	Soils having a moderate infiltration rate when thoroughly wet. They are chiefly moderately deep, well-drained soils of moderately fine to moderately coarse texture such as shallow loess and sandy loam.
C	0.05-0.15	1.2-3.8	Soils having a slow infiltration rate when wet. They are soils with a layer that impedes downward movement of water, and soils of moderately fine-to-fine texture such as clay loams, shallow sandy loams, soils low in organic content, and soils high in clay content.
D	0.00-0.05	0.00-1.2	Soils having a very slow infiltration rate. They are chiefly clay soils with a high swelling potential, soils with a permanent high water table, soils with a claypan at or near the surface, shallow soils over nearly impervious material, heavy plastic clays, and certain saline soils. They have high runoff potential.

TABLE 4

Plant Species Observed at the Cherry Point Cogeneration Project area in Whatcom County, Washington

Vegetation Layer	Common Name	Scientific Name	Wetland Indicator Status[a]
Tree			
	Alaska cedar	*Chamaecyparis nootkatensis*	FAC
	Douglas-fir	*Pseudotsuga menziesii*	FACU
	Western red cedar	*Thuja plicata*	FAC
	Black cottonwood	*Populus trichocarpa*	FAC
	Walnut	*Juglans* spp.	NI
	Pear	*Crataegus* spp.	NI
	Red alder	*Alnus rubra*	FAC
	Paper birch	*Betula papyrifera*	FAC
	Pacific silver fir	*Abies amabilis*	FACU
	Vine maple	*Acer circinatum*	FAC-
Shrub	Salmonberry	*Rubus spectabilis*	FAC+
	Twinberry	*Lonicera involucrata*	FAC+
	European red elderberry	*Sambucus racemosa*	FACU
	Oceanspray	*Holodiscus discolor*	NI
	Hardhack	*Spiraea douglasii*	FACW
	Snowberry	*Symphoricarpos albus*	FACU
	Sitka willow	*Salix sitchensis*	FACW
	Scouler's willow	*Salix scouleriana*	FAC
	Indian plum	*Oemleria cerasiformis*	FACU
	Himalayan blackberry	*Rubus discolor*	FACU
	Evergreen blackberry	*Rubus laciniatus*	FACU+
	Devil's club	*Oplopanax horridus*	FAC+
Herb			
	Canada thistle	*Cirsium arvense*	FACU+
	Piggy-back plant	*Tolmiea menziesii*	FAC
	Red clover	*Trifolium pratense*	FACU
	Creeping buttercup	*Ranunculus repens*	FACW
	Curly dock	*Rumex crispus*	FAC+
	Bleeding heart	*Dicentra formosa*	FACU
	Chickweed	*Stellaria media*	FACU
	Sword fern	*Polystichum munitum*	FACU
	Slough sedge	*Carex obnupta*	OBL
	Stinging nettle	*Urtica dioica*	FAC+
	Quackgrass	*Agropyron repens*	FAC-
	Common catsear	*Hypochaeris radicata*	NI
	Hardstem bulrush	*Scirpus acutus*	OBL
	Colonial bentgrass	*Agrostis tenuis*	FAC

TABLE 4

Plant Species Observed at the Cherry Point Cogeneration Project area
in Whatcom County, Washington

Vegetation Layer	Common Name	Scientific Name	Wetland Indicator Status[a]
	Least spikerush	*Eleocharis acicularis*	OBL
	Bluegrass	*Poa pratensis*	FAC
Herb	Bull thistle	*Cirsium vulgare*	FACU
	Rough bluegrass	*Poa trivialis*	FACW
	Orchard grass	*Dactylis glomerata*	FACU
	Meadow foxtail	*Alopecurus pratensis*	FACW
	Sword fern	*Polystichum munitum*	FACU
	Dandelion	*Taraxacum officinale*	FACU
	Lady's thumb	*Polygonum persicaria*	FACW
	Soft rush	*Juncus effusus*	FACW
	Merten's rush	*Juncus mertensianus*	OBL
	Starry false soloman's seal	*Smilacina stellata*	FAC-
	Birds-foot trefoil	*Lotus corniculatus*	FAC
	Reed-canary grass	*Phalaris arundinacea*	FACW
	Tall fescue	*Festuca pratensis*	FACU+
	Baltic rush	*Juncus balticus*	FACW+
	Velvetgrass	*Holcus lanatus*	FAC
	Vernal sweetgrass	*Anthoxanthum odoratum*	FACU
	Bittersweet nightshade	*Solanum dulcamara*	FAC+
	Tiny vetch	*Vicia hirsuta*	NI
	Iris	*Iris missouriensis*	FACW+
	False solomon's seal		
	English plantain	*Plantago lanceolata*	FAC
	Common plantain	*Plantago major*	FACU+
	Red top	*Agrostis alba*	FAC
	Rye grass	*Elymus canadensis*	FAC
	Giant horsetail	*Equisetum telmateia*	FACW

[a] See Table 1 for definitions.

TABLE 5

Wetland Acreage and Proposed Impacts Due to Construction of the Proposed Cogeneration Project and Related Facilities

Wetland Area	Wetland Location	Wetland Type	Size		Proposed Disturbance to Wetland Area (acres)
			Acres	Square feet	
A	Plant Site	Palustrine emergent with planted hybrid poplars	1.69	73,616	0.46
B1	Plant Site	Palustrine emergent	0.13	5,662	0.14
B2	Plant Site	Palustrine emergent	1.28	55,757	1.30
B3	Plant Site	Palustrine emergent	0.27	11,761	0.26
B4	Plant Site; Laydown Area 4	Palustrine emergent	1.3	56,628	1.26
C	Plant Site	Palustrine emergent	4.38	190,793	0.88
D	Plant Site	Palustrine emergent	40.21	1,751,547	6.34
E	Outside of impact	Forested	1.25	54,450	0.0
F	Laydown Area 1	Palustrine emergent	13.71	597,208	12.44
G	Laydown Area 3	Palustrine emergent	5.46	237,838	5.46
H	Access Road 2	Palustrine emergent	Approx. 8	348,480	0.22
I	Outside of impact	Palustrine emergent/forested	0.15	6,534	0.0
J	Laydown Area 1	Palustrine emergent	4.39	191,228	4.39
Total					**33.15**

FIGURES

APPENDICES

APPENDIX A

SITE PHOTOGRAPHS

APPENDIX C

PROJECT AREA WETLAND DATA FORMS

APPENDIX B

WETLAND RATING FIELD DATA FORMS

WETLAND A

WETLAND B

WETLAND C

WETLAND D

WETLAND E

WETLAND F

WETLAND G

WETLAND H

WETLAND I

WETLAND J